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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,636	07/15/2003	John MacNeil	WLJ.070D	5656

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EXAMINER

PHAM, THANHHA S

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 02/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/618,636

Applicant(s)

JOHN MACNEIL ET AL.

Examiner

Thanhha Pham

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-- Th MAILING DATE of this communication app ars on th cov r sheet with th c rr spondence addr ss --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 9-11 and 13 is/are pending in the application.
- 4a) Of the above claim(s) 1-3 and 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10, 11 and 13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 09/760,820.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>07/15/03</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

This Office Action is in response to Applicant's Response to Restriction Requirement dated 12/09/2004.

Election/Restrictions

1. Claims 1-3 and 9 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 12/09/2004.
2. Applicant's election without traverse of claims 10-11 and 13 in the reply filed on 12/09/2004 is acknowledged.

Oath/Declaration

3. Oath/Declaration dated 07/15/2003 has been considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an

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application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 10-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Bjorkman et al. [US 6,340,435].

► With respect to claim 10, Bjorkman et al. (fig. 1B, abstract, cols. 2-6) discloses the claimed stack of dielectric layers (10/12, col. 6 lines 1-7) when in each layer is formed a different material (*material of the first low-k dielectric layer 10 is a different material to the material of the second low-k dielectric layer 12 since composition of the first low-k dielectric layer 10 contains more C and H than composition of the second low-k dielectric layer 12*), the materials having detectably different etch characteristics (*the first low-k dielectric layer 10 has an etch rate at least 3 times lower than the second low-k dielectric layer 12*) but generally equal dielectric constants (*both of the first low-k dielectric layer 10 and the second low-k dielectric 12 have a dielectric less than 3*).

► With respect to claim 11, Bjorkman et al. (col. 6 lines 1-7) discloses wherein the selectivity between adjacent layers (10 and 12) is at least 2.5:1.

5. Claims 10, 11 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang et al. [US 6,255,735].

► With respect to claim 10, Wang et al. (fig. 3, abstract, cols. 1-8) discloses the claimed stack of dielectric layers (14/18, col. 6 lines 1-11) when in each layer is formed a different material (*material of the first low-k dielectric layer 14 is of HSQ when material of the second low-k dielectric layer 18 is of BCB*), the materials having detectably different etch characteristics (abstract: *the first low-k dielectric layer 14 and the second low-k dielectric layer 18 are different from one another so that they have*

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different sensitivity to at least one etchant chemistry) but generally equal dielectric constants (both of the first low-k dielectric layer 14 and the second low-k dielectric 18 have generally equal dielectric constants because the first low-k dielectric layer 14 (HSQ) and the second low-k dielectric 18 (BCB) have low k dielectric constants).

► With respect to claim 11, Wang et al. (abstract) shows wherein the selectivity between adjacent layers (first and second low-k dielectric layers) is at least 2.5 (by employing an etch chemistry that etches only the second low-k dielectric material *(the second low-k dielectric 18)* and not the first low-k dielectric material *(the first low-k dielectric 14)*).

► With respect to claim 13, Wang et al. (col. 6 lines 1-11) discloses the first low-k dielectric layer (14) being of HSQ and the second low-k dielectric layer (18) being of BCB. In the stack of dielectric layers of Wang, the difference in dielectric constants of the materials (HSQ and BCB) of the adjacent layers (first and second low-k dielectric layers 14 and 18) varies by less than 10% (HSQ having a dielectric constant of 2.2-2.7 and BCB having a dielectric constant about 2.7).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bjorkman et al. [US 6,340,435].

With respect to claim 13, the claimed range of difference between the dielectric constants of the materials of adjacent layers would have been obvious to an ordinary artisan practicing the invention because, absent evidence of disclosure of criticality for the range giving unexpected results, it is not inventive to discover optimal or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955). Furthermore, it appears that these changes produce no functional differences and therefore would have been obvious. See *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

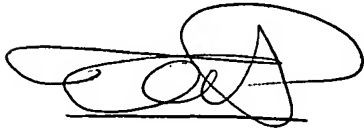
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanhha Pham whose telephone number is (571) 272-1696. The examiner can normally be reached on Monday and Thursday 9:00AM - 9:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Thanhha Pham', with a horizontal line underneath.

Thanhha Pham
Patent Examiner
Patent Examining Group 2800